Appendix to Amendment A

with Replacement Paragraphs Marked-up to Indicate Changes

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Pursuant to Rule 121, the following is a copy of all of the paragraphs amended by the attached Amendment A, with all changes indicated by bracketing deletions and underlining additions:

Page 5, first paragraph, replace with the following new paragraph:

– One of possible solutions for the mechanism allowing radial movement of the piston in a manner that its outer facet tightly contours the inner surface of the stator, preventing leak of gasses between working chambers formed on both sides of the piston, is creating a guiding grooves, concentric with the whole system, in [[a]] lids that form the bases of the cylindrical body of the engine that mimic the inner surface of the stator, and providing the piston with a lugs that move in the guiding groves.

Page 5, title of the subsection and immediately following paragraph, replace with the following new title and paragraph:

– PREFERRED [[EMBODYMENT]] **EMBODIMENT** – Figures 1-5

Major parts of the proposed invention are presented on Fig. 1, Fig. 2, Fig. 3, Fig. 4 and Fig. 5. A rotary internal combustion engine comprises a rotor 20 having a cylindrical body 22 sitting on a shaft 24. The cylindrical body of the rotor has a radial grove 26 made along its whole height. The grove of the rotor houses a piston 30 having a rectangular body 32 whose height equals the depth of the groove [[28]] **26**, length equals the height of the cylindrical body of the rotor and width equals the width of the grove. The piston can freely move in radial direction within the grove of the rotor. In current version of the engine

design the piston is provided with a cylindrical lugs 34 on its sides facing the bases of the rotor as part of the mechanism that allows radial motion of the piston. The rotor 20 with the piston 30 is mounted within a prism-shape stator 10 of the same height as that of the rotor concentrically to its inner cylindrical surface 12 with the help of a two side cover lids 40 and 50 having openings 43 and 53 for the rotor's shaft 24 concentric to the rotor and to the inner surface of the stator. The surfaces of the **side cover** lids 40 and 50 facing the stator's interior have an annular guiding grooves 42 and 52 into which the lugs 34 of the piston 30 fit to form one probable mechanism that allows radial motion of the piston during rotation of the rotor 20. The shape of the guiding groove has to be made such that it would provide tight contouring of the inner surface 12 of the stator 10 by the piston's body 32 outer facet. Whole assembly of the rotor 20, piston 30, stator 10, lids 40 and 50 is secured by bolts 54 and nuts 44.

Page 5, last paragraph (extends to page 6), replace with the following new paragraph:

– The diameter of the inner cylindrical surface 12 of the stator 10 has to be such that to ensure secure positioning of the piston 30 within the groove 26 of the rotor 20 while the piston is pulled out in radial direction from the grove to be pressed with its outer [[adge]] **edge** against the inner surface of the stator. Within the short distance on the perimeter of the inner cylindrical surface 12 of the stator 10 its diameter is made equal to that of the cylindrical body 22 of the rotor 20, and the inner surface with smaller diameter smoothly transits to the surface with bigger diameter with surface ramps. In the area where the diameter of the inner cylindrical surface 12 of the stator 10 equals that of the cylindrical body 22 of the rotor 20 a cavity, which forms a combustion chamber 14 is made within the body of the stator 10. The combustion chamber 14 is connected to the working chamber 13 of the engine formed between the outer surface of the cylindrical body 22 of the rotor 20 and the inner cylindrical surface 12 of the stator 10 with bigger diameter via a compression orifice 64 and power orifice 16 made in the ramp areas of the inner surface 12 of the stator 10 and controlled by a compression valve 84 and a power valve 18, respectively (see Fig. 5). A spark-plug 62 faces the volume of the combustion chamber 14.

Page 6, paragraph 4, replace with the following new paragraph:

– An [[ambience]] **ambient** conduit/orifice 72, controlled by an [[ambience]] **ambient** valve 82, made within the body of the stator 10 in the immediate vicinity to the power orifice 16, connects atmospheric ambience C to the working chamber 13 of the engine formed between the outer surface of the cylindrical body 22 of the rotor 20 and the inner cylindrical surface 12 the stator 10 with bigger diameter to balance the pressure on one of the piston's 30 side.

Page 6, between paragraphs 4 and 5, insert the following new paragraph:

– **The valves 18, 82, 84, 86, 88 must be operated by the mechanisms that provide the necessary timing of physical connection among various chambers during engine operation.**

Page 6, paragraph 5, replace with the following new paragraph:

– Two or more engines are easily arranged as an integral unit. In this case the **side cover** lids (i.e., 40 or 50), which separate the engines will have to be made double-sided (i.e. with 42-like guiding grooves on both sides) and the shafts 24 of the rotors 20 facing each other have to be provided with fitting and connecting mechanism.

Page 7, paragraph 2, replace with the following new paragraph:

– The second, compression cycle (Fig. 7) starts when the piston body 32 exits the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14). At this time the compression valve 84 opens the compression orifice 64 into the combustion chamber 14. The excessive positive pressure created on the side of the piston body 32 facing the compression orifice 64 helps to drive the fuel mixture from the working chamber 13 into the combustion chamber 14. Immediately after the piston body 32 passes the [[ambience]] **ambient** orifice 72 during clockwise rotation of the rotor 20 the ambience valve 82 opens as well helping to dissipate the depression created on the side of the piston body 32 facing the [[ambience]] **ambient** orifice 72 by letting the atmospheric ambient air C into the working chamber 13. Immediately after the piston body 32 during clockwise rotation of the rotor 20 passes the

compression orifice 64 and enters the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14) the compression valve 84 as well as the [[ambience]] **ambient** valve 82 close. At the end of the second, compression cycle the compressed fuel mixture remains locked in the combustion chamber 14, whereas the working chamber 13 remains filled with ambient air at atmospheric pressure.

Page 7, last paragraph (extends to page 8), replace with the following new paragraph:

– The third, power cycle (Fig. 8) starts when the piston body 32 exits the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14) and just passes the power orifice 16. At this time the power valve 18 opens and synchronously the spark-plug 62 ignites the compressed fuel mixture in the combustion chamber 14. Expanding combusted gases exit through the power orifice 16 from the combustion chamber 14 to the working chamber 13 and apply force to the side of the piston body 32 that faces power orifice 16 providing thereby the torque to the rotor 20 in the clockwise direction. **It would be advantages to have ramp surface containing power orifice 16 controlled by power valve 18 maximally parallel to the radial plane (i.e., to the side surface of the piston 32) to permit immediate near full extension of the piston 32 upon exit from the region underneath the combustion chamber 14 before ignition of the fuel mixture in the combustion chamber 14 in order to provide near maximal torque right from the beginning of the power cycle.** At the beginning of the power cycle the exhaust valve 86 opens as well letting the atmospheric air B, working chamber 13 was filled in, through the exhaust orifice/conduit 66 out of the working chamber dissipating thereby the excessive positive pressure created on the side of the piston body 32 facing the exhaust orifice 66. Immediately after the piston body 32 during clockwise rotation of the rotor 20 enters the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14) the power valve 18 closes. At the end of the third, power cycle the combustion chamber 14, as well as working chamber 13 are filled with burned fuel gases.

Page 8, paragraph 2, replace with the following new paragraph:

– The last, fourth exhaust cycle (Fig. 9) starts when the piston body 32 exits the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14) and just passes the [[ambience]] **ambient** orifice 72. At this time the [[ambience]] **ambient** valve 82 opens whereas the exhaust valve 66 still remains open from the previous cycle. The excessive positive pressure created on the side of the piston body 32 facing the exhaust orifice 66 during clockwise rotation of the rotor 20 drives burned gasses B through the exhaust orifice/conduit 66 to the exhaust system whereas open [[ambience]] **ambient** valve 82 lets atmospheric air C into the working chamber 13 through the [[ambience]] **ambient** orifice/conduit 72 to compensate for the depression created on the side of the piston body 32 facing the [[ambience]] **ambient** orifice 72. Immediately after the piston body 32 during clockwise rotation of the rotor 20 enters the region underneath the combustion chamber 14 (see Fig. 10 for consecutive positions of the piston 30 during contouring the combustion chamber 14) the [[ambience]] **ambient** valve 82 closes. At the end of the fourth, exhaust cycle the working chamber 13 becomes filled with atmospheric air at normal pressure and the combustion chamber 14 remains filled with the remnant of burned fuel gases.